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Research Statement

My research examines how the optimal decisions of households and firms, influenced by market imperfections, interconnect through general equilibrium effects, driving pervasive economic outcomes. I analyze how market imperfections, such as labor market or informational frictions, jointly propagate shocks across markets and either amplify or dampen aggregate fluctuations. This market interplay helps explain phenomena such as deep recessions or protracted recoveries, which cannot be fully understood by analyzing individual markets or actors in isolation. I believe that a deeper understanding of how small disturbances can trigger widespread economic downturns is crucial for developing policies to stabilize economies and mitigate the severity of future crises.

My work falls into two broad categories: (i) determinants of aggregate demand, where I examine the macroeconomic effects of idiosyncratic risk, aggregate uncertainty, and other factors, along with their implications for time-varying saving and monetary policy; and (ii) the wider impact of uncertainty and risk. My research primarily relies on quantitative macroeconomic models, often featuring household or firm heterogeneity, and empirical analysis of large-scale micro-level data. Below is a summary of my published papers and completed works, organized by field.

I. Saving, Aggregate Demand, and Monetary Policy

Economies are inherently exposed to various shocks that lead to macroeconomic fluctuations. However, these fluctuations often become inefficient due to frictions in the goods market, causing consumption and saving behaviors to deviate from the optimal first-best scenario. This inefficiency can be exacerbated when goods market imperfections are compounded by labor market or informational frictions. In the absence of perfect insurance mechanisms, the impact of initial shocks can amplify cyclical demand for precautionary saving, leading to depressed aggregate demand, further destabilizing the economy, and carrying significant implications for monetary policy. My work in this area explores the determinants of aggregate demand, with a particular focus on the precautionary saving motive and its cyclical variations.

While much of the literature emphasizes the detrimental impact of cyclical unemployment risk on macroeconomic fluctuations, my job-market paper, *"Precautionary Saving, Wage*

Risk, and Cyclical Reallocation" (Working Paper), explores the aggregate implications of wage risk – another source of time-varying income risk that is not related to unemployment. I focus on wage risk stemming from on-the-job search, which, in its turn, shapes worker advancement along the job ladder through cyclical job-to-job reallocations. My main theoretical finding is that on-the-job search affects wage risk and the related precautionary saving motive through two channels: (i) the reallocation channel, which arises because career advancement through job-to-job transitions and the associated wage increases are rarer during recessions than in normal times, and (ii) the relative wage channel, driven by the fact that the size of these wage increases themselves depends on the stage of the business cycle. I demonstrate the presence of these two channels analytically within a tractable labor market model and then examine the role of wage risk stemming from them in a quantitative general equilibrium framework.

To explore the impact of cyclical wage risk in the propagation of aggregate shocks, I develop a heterogeneous-agent New-Keynesian model with a frictional labor market, extended to incorporate on-the-job search. Using a tractable version of my model with limited heterogeneity, I demonstrate analytically – and then in a full-fledged quantitative version – that both the reallocation and relative wage channels generate time-varying precautionary asset accumulation. This additional precautionary saving depresses aggregate demand, magnifying fluctuations in output and employment. In a realistically calibrated model, the introduction of wage risk leads to a significant amplification of consumption and output – up to 40% compared to the case with no dynamic job ladder – with three-quarters of the amplification stemming from the reallocation channel. I conclude the paper by demonstrating the empirical relevance of these two channels. Using individual-level data from the Survey of Income and Program Participation, I validate the plausibility of both channels, finding strong support in the data. My results suggest that cyclical wage risk could be an essential destabilizing factor in the propagation of aggregate shocks.

In the paper *"Supply Shocks in the Fog: The Role of Endogenous Uncertainty" (Working Paper)*, co-authored with Anastasiia Antonova and Céline Poilly, we examine the impact of cyclical precautionary saving driven by fluctuations in aggregate uncertainty, as opposed to time-varying idiosyncratic income risk in models with the frictional labor market. We begin by demonstrating that a significant share of the economy's empirical response to productivity shocks can be attributed to the endogenous evolution of uncertainty. Moreover, we show that the countercyclical nature of this uncertainty is plausibly explained by the presence of informational frictions. Motivated by our empirical findings, we develop a noisy-information New-Keynesian model that features procyclical learning, where agents possess more precise information in normal times than during downturns. Procyclical learning gen-

erates an empirically realistic, endogenous countercyclical aggregate uncertainty, which acts as a destabilizing mechanism: higher uncertainty during recessions leads to increased precautionary saving. Theoretically, we show that the endogenous evolution of uncertainty, driven by procyclical learning, can reverse the standard New-Keynesian result, where negative productivity shocks typically generate a supply-driven recession (a decline in output accompanied by inflation). In our model, rising uncertainty during recessions triggers precautionary saving, which suppresses aggregate demand, output, and prices. As a result, a productivity shock takes on the characteristics of a demand shock, causing both output and prices to fall, resulting in a strongly amplified output response. Quantitatively, we find that countercyclical uncertainty, and the resulting time-varying precautionary saving, roughly doubles the magnitude of the output and consumption response, contributing to overall economic destabilization. Finally, we demonstrate that this uncertainty channel can also influence the propagation of other shocks, such as government spending shocks.

In the paper *"On Natural Interest Rate Volatility" (European Economic Review, 2024)*, coauthored with Edouard Challe, we broadly examine the drivers behind the sensitivity of the natural interest rate. This sensitivity poses challenges for monetary policy, especially in the presence of the effective lower bound (ELB). While much of the literature emphasizes structural changes as the primary factors driving the *level* of the natural interest rate downward at least since the late 1980s —- leading to more frequent ELB episodes – we argue that changes in the *volatility* of the natural interest rate are equally important. This volatility directly impacts the frequency of ELB occurrences and is a critical aspect to consider alongside the secular decline in interest rate levels.

Using a tractable version of an overlapping-generations (OLG) model, we identify several factors that could have theoretically increased the responsiveness of the natural interest rate in recent decades: (i) decreased competition in goods markets, (ii) a higher share of out-of-pocket health expenses, and (iii) rising public debt. We suggest that these factors may have contributed to flattening both the aggregate saving demand and supply curves, thereby potentially increasing the sensitivity of the equilibrium interest rate to shifts in either curve. To quantify the contribution of these factors over time, we employ a quantitative version of our OLG model with two calibration sets, representing the U.S. economy in 1980 and 2020. We examine the interest rate's response to productivity shocks (shifts in the saving demand curve) and impatience shocks (shifts in the saving supply curve). Our results suggest that the interest rate's response to productivity and impatience shocks might have increased by 40% and 50%, respectively, between 1980 and 2020, due to the flattening of the saving demand and supply curves. Among these factors, decreased goods market competition emerges as the primary driver of the increased interest rate volatility in recent decades.

In my future work, I plan to continue investigating the role of risk and precautionary saving in the propagation of aggregate shocks. In my solo-authored ongoing project, "The MPC Puzzle in HANK & SAM Models," I examine the role of household heterogeneity in an economy's adjustment to shocks under cyclical unemployment risk. Besides, in a joint project with A. Antonova and E. Challe "Skewed wage risk and consumption over the business cycle", we explore how higher-order moments of cyclical income risk shape aggregate demand.

II. Broader Impact of Uncertainty and Risk

Expectations about future changes in income risk and uncertainty affect more than just precautionary saving; they also have broader implications for aggregate dynamics, even without contributions from other imperfections. In several of my works, I explore the broader role of changing expectations – both in the level and risk of economic fundamentals – under scenarios with and without the possibility of delaying decisions.

In the project *"News and Firm Entry: The Role of the Waiting Option" (Revise and resubmit in the Journal of Economic Dynamics and Control)*, co-authored with Anastasiia Antonova, we investigate how expectations of future productivity growth shape business formation in an environment where decisions are irreversible but can be postponed. We begin by documenting that the unconditional volatility of capital investment is twice as large as that of firm entry, despite the literature often treating both as alternative forms of investment. We then show that both series exhibit similar empirical volatilities when conditioned on productivity shocks. However, news shocks produce a much more muted response of firm entry, suggesting that news shocks may be the source of the differing unconditional volatilities. Conventional news-driven business cycle models struggle to replicate these empirical properties, often producing excessively volatile firm entry in response to news shocks, which results in excessive unconditional volatility. To address this issue, we introduce an entry delay option in the firm entry decision within an otherwise standard Real Business Cycle framework. While positive news generally increases firm value and encourages immediate firm entry, the delay opportunity introduces a counterbalancing force. This force makes it beneficial for potential entrants to postpone their entry decision until the positive news materializes. We demonstrate these mechanisms analytically through a simplified version of the model, which provides an interpretable closed-form solution. Incorporating the delay option into the quantitative model allows for better alignment with observed data, successfully replicating the relatively low volatility of firm entry compared to capital investment.

In the project *"Age-Specific Income Risk and Consumption Over the Life Cycle" (Working Paper)* co-authored with Anastasiia Antonova, we document the time variation in income risk across different age groups and examine how these age-specific variations shape the age

profile of consumption. Using U.S. household-level data, we identify a series of shocks that disproportionately increase income risk among older households. We then demonstrate that these shocks have a disproportional effect on consumption across the population: middle-aged households experience the most substantial drop in consumption, even though they are only moderately affected by the income risk shock targeting older households. In contrast, older households, despite being the most exposed to the shock, make minimal adjustments to their consumption. We interpret these findings through the lens of the conventional life-cycle consumption framework, extended to account for income risk. The model suggests that old-age-specific income risk shocks carry information about future risks, making middle-aged workers particularly sensitive to increased risk due to their proximity to retirement (compared to younger individuals) and lower levels of accumulated wealth (compared to older individuals). By accounting for heterogeneity in marginal propensities to consume and prudence across different age and wealth groups, we demonstrate that the model successfully replicates the empirical U-shaped profile of consumption adjustment.

For future work, I plan to empirically explore the real option effect, identifying this effect in firm-level data based on the theoretical results from my joint paper “News and Firm Entry: The Role of the Waiting Option". Additionally, I aim to investigate the role of expectations in economies with heterogeneous agents, focusing particularly on deviations from the full-information rational expectations hypothesis.